Christy Lee

IB MYP Year 5

Year 10 Mathematics

Assessment #3

TRIGONOMETRIC PATTERNS

Unit Question: How do we get around? aTeachers: Ms. Luk & Mr. Slosberg
End Date: March 15, 2013 Time Allowed: Double Lesson
Concept Statement: The student will discover one or two formulas which will be useful in the future.

The objective of this task is discover a useful formula for finding out new trig. values from old ones.

IN YOUR BOOK:

- New Trends Mathematics, Chapter 3 & 9 on Trigonometry

INSTRUCTIONS:

- Read the **instructions** and **rubric** carefully.
- Show all **steps** and proper **units.**
- Submit **your own work**. Any copying or other cheating, will automatically receive a 0.
- You are allowed to use non-electronic **dictionary.**
- **Calculators** are allowed.

ASSESSMENT:

- Read the criteria descriptors on the next page carefully before you start your work. This will give you a clear understanding of what is required and what a quality piece of work for this task must include. This way you give yourself the best chance of achieving the highest level in this task.
- This task assesses Criteria B.

Criterion B: Investigating Patterns

Achievement level	Task Specific Rubric	IBO Published Descriptor	Student's Self-Evaluation
0	The student does not reach a standard described by any of the descriptors given below.	The student does not reach a standard described by any of the descriptors given below.	
1–2 Do Maths	The student can calculate trigonometric values correctly.	The student **applies, with some guidance**, mathematical problem-solving techniques to recognize **simple** patterns.	**(0-8)**
3–4 General Rule	The student comes up with a general rule relating the trigonometric ratios.	The student **applies** mathematical problem-solving techniques to recognize patterns, **and suggests** relationships or general rules.	**Teacher's Final Grade**
5–6 Test it	The student tests their general rule by taking a few more examples.	The student **selects and applies** mathematical problem-solving techniques to recognize patterns, **describes** them as relationships or general rules, and **draws conclusions** consistent with findings.	
7–8 Prove it	The student explains how certain they are that they are right and why.	The student **selects and applies** mathematical problem-solving techniques to recognize patterns, **describes** them as relationships or general rules, draws the **correct conclusions** consistent with the correct findings, and **provides justifications or proofs.**	**(0-8)**

ASSESSMENT

Level 1-2

1.Given the following expressions, evaluate

a.sin(x)
b.sin(2x)
c.$\sin^2(x)$
d.cos(x)
e.cos(2x)
f.$\cos^2(x)$

for x = 30°, 150°, 240°, 330°.

Level 3-4

2. Organize the data you found from question 1.
3. Describe a general rule you found involving either sin(2x) or cos(2x)

Level 5-6

4. Suggest another example or two to make certain it is right.

Level 7-8

5.Test your pattern with other methods/identities, justify your formula(s) and give limitations if there's any.

~ End of Assessment ~

~~sin 2~~

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1a) $\sin 30^\circ$

$= \frac{1}{2}$

$\sin 150^\circ$

$= \frac{1}{2}$

$\sin 240^\circ$

$= -\frac{\sqrt{3}}{2}$

$\sin 330^\circ$

$= -\frac{1}{2}$

1b) $\sin 30^\circ (2)$

$= \sin 60^\circ$

$= \frac{\sqrt{3}}{2}$

$\sin 150^\circ (2)$

$= \sin 300^\circ$

$= -\frac{\sqrt{3}}{2}$

$\sin 240^\circ (2)$

$= \sin 480^\circ$

$= \frac{\sqrt{3}}{2}$

$\sin 330^\circ (2)$

$= \sin 660^\circ$

$= -\frac{\sqrt{3}}{2}$

1c) $\sin^2 (30^\circ)$

$= 0$

$\sin^2 (150^\circ)$

$= 0$

$\sin^2 (240^\circ)$

$= 0$

$\sin^2 (330^\circ)$

$= 0$

1d) $\cos (30^\circ)$

$= \frac{\sqrt{3}}{2}$

$\cos (150^\circ)$

$-\frac{\sqrt{3}}{2}$

$\cos (240^\circ)$

$-\frac{1}{2}$

$\cos (330^\circ)$

$= \frac{\sqrt{3}}{2}$

1e) $\cos (2 \times 30^\circ)$

$= \cos 60^\circ$

$= \frac{1}{2}$

$\cos(2 \times 150°)$

$= \cos 300$

$= \frac{1}{2}$

$\cos(2 \times 240°)$

$= \cos 480°$

$= -\frac{1}{2}$

$\cos(2 \times 330°)$

$= \cos 660°$

$= \frac{1}{2}$

1 f) $\cos^2(30°)$

$= -1$

$\cos^2(150°)$

$= 0$

$\cos^2(240°)$

$= 1$

$\cos^2(330°)$

$= -1$

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		Sin(x)	sin(2x)	$\sin^2(x)$	Cos(x)	cos(2x)	$\cos^2(x$
2)	$30°$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$ (60°)	0	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	-1 (6
	$150°$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$ (300°)	0	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	0 (300
	$240°$	$-\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{2}$ (480°)	0	$-\frac{1}{2}$	$-\frac{1}{2}$	1 (48
	$330°$	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$ (660°)	0	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	-1 (660

3) Describe a general rule you found involving either sin (2x) or cos(2

The general rule I found involving sin (2x) was $\frac{\sqrt{3}}{2}$, $-\frac{\sqrt{3}}{2}$ $\frac{\sqrt{3}}{2}$ and $-\frac{\sqrt{3}}{2}$.

Suggest another example or two to make certain it is right.

4) cos(420)(2)

= cos 840

= $-\frac{1}{2}$

5)